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N AND MODE OF OCCURRENCE OF GOLD-BEARING VEINS AND OF THE ASSOCIATED MINERALS. BY JONATHAN C. B. P. SEAVER, C. E., F. G. S. &c.

(Continued.)

ny believe that lodes have been formed under all or most of the various ons described, and that no particular one can be made to account for phenomena observed, and it is quite likely that such has been the a certain, but I believe only to a limited extent, and that most modes rrence can be accounted for by the theory of lateral secretion, comwith it the probability that the minerals have not in all cases been ed at the very spot at which they entered the fissures, but may in some es have been carried by circulating currents for some distance before precipitated. This will allow the theory of ascending water holding in solution to be sometimes, but not necessarily always, the one by the metals or mineral matter have been conveyed and lodes formed.

regards the auriferous lodes of Australasia and other parts of the they certainly do not in my opinion bear any sign of igneous injecor not only does it seem impossible for such a complete ramification or k of quartz veins, as commonly occurs in rocks in our gold fields, to een formed by the injection of molten matter, but deposits of quartz e are found completely separated from any other lode or vein, and to inlet through which molton matter could have found its way. One naturally also expect to see some evidence of intense heat in the or hardening of the sides of the fissures, as may be seen where sediy strata are in contact with igneous rocks, such as dykes or dolerite r rocks of volcanic origin, which have been at one time in a highly state

a sublimation theory is also met by somewhat similar difficulties, as way in which metals could reach such places as we often find them in, should moreover expect to find, were this theory correct, that all veins richer in character the deeper they are worked. I need hardly say

not universal in the history of our mines. ving, however, done away with the igneous injection and sublimation es, as regards the mode under which the greater number of mineral have been formed, and having endeavoured to show their entire inaplity to the quartz veins of Australasia, I think before seeking to prove teral secretion or any other mode is best applicable to auriferous lodes, ld try to account in the most reasonable way for the forming of these s or openings in the rocks, that afterwards became filled with the ils of which the lodes consist, for as I have put injection aside, which ers the containing channels of the veins and lodes to have been formed o most part about the same time as the injection of the molten vein , no other theory, unless it be that of molecular aggregation considers hannels were not already open to some extent before the deposition of in matter commenced.

true fissure lodes may generally be seen to have been formed upon a n the country, the origin of such channels is at once apparent, and can on to have been caused by a violent rending of the rocks, making use cracks in them, generally independent of all natural planes. These may be opened either by tilting of the rock on both or either side, or the walls sliding on one another, or by a separation of the walls to

a gaping fi-sure. The disturbance of the rock, leading to such fissures being formed, may to one or two causes. Ist. A sinking of the strata in a certain place another portion remained firm would lead to the formation of a system ks or fissures. 2nd. The intrusion of an igneous rock would act in a but more violent mannner.

both cases fissures would be formed, but in the former the action being ly slower, the fractures would be most likely to follow natural planes country rock, and hence the instances in which we find systems of coinciding with and often crossing each other in the bedding and joint of the rock.

he folding of strata into anticlinals and synclinals may also lead to res somewhat similar to those which would be formed by bending a of iron or wood, and this may cause such cavities or fractures as those contain the saddle reefs at Sandhurst in Victoria.

have very little doubt that many fissures are increased in size by the ation of subterranean waters, and are sometimes worn into irregular s and openings that are afterwards filled with ore, and it is also quite that such chambers and pockets as seem to have no inlet or outlet, may been excavated by the action of solvent waters that carried away the als through the pores of the country rock, and the reason for believing o be the explanation of such cavities will be seen further on when I of lateral secretion.

a theory that veins have been formed by a molecular substitution and gation of minerals like pegmatite veins in granite, must terminate with ct that such veins have not smooth and regular boundaries like the wall les, but gradually merge into the adjoing rock, large crystals of felspar occurring, part in the vein and part in the granite.

ne idea held by some that veins of quartz and lodes in general have formed upon natural planes in the slightly open or fractured rock, and hat the included mineral has, by its expansion during crystallization, open the cracks, and by repeated action of this sort quartz veins or kinds of lodes of various dimensions have been formed, can only be on the supposition that the lodes were formed near the surface, and t extend to any depth.

(To be Continued.)

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